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MATHEMATICS IN STUYVESANT HIGH SCHOOL.

For the past three years Stuyvesant High School has been using for the first four terms a course radically different from the old established arrangement of a year of algebra followed by a year of geometry.

The controlling aim of the new course is: To give the pupil the mathematics that is best for him whatever the length of his school course. This means making provision for the boy who can remain in school only ten weeks, giving him what he needs most, and at the same time not neglecting the proper training of the boy who will go to college. Moreover, it is desirable that these two boys be taught in a single course rather than in separate courses, since the former boy may be persuaded to continue in school and go to college.

Suppose a pupil can remain in school only ten weeks. What mathematics can we give him that will be of most value to him? If he leaves school and goes to work, he may desire to go to an evening school and study mechanics or physics. He may desire to read a mechanic's handbook and know how to use the formulas in his daily work. Whatever he may do for living, he will find it very useful to know how to use the practical parts of elementary mathematics. This includes:

1. The ability to make a formula, use it, solve it for any letter, and interpret the result;
2. The knowledge of how to measure ordinary plane and solid geometrical figures;
3. Practice in computation, including the checking of all operations, until reasonable accuracy is secured;
4. A natural introduction to algebraic work through the motivation of the real problem;
5. Preparation for demonstrative geometry through familiarity with the material of the subject found in the mensuration of practical problems.

A graded series of real problems captures the interest of the pupils at the start and holds it throughout the course. From the first lesson in which the boy measures the height of the

room in which he is sitting, by the use of a simple isosceles right triangle cut out of pasteboard and from this makes his own formula, to the more difficult problem of laying out a baseball diamond, involving a quadratic equation, the growth in correct mathematical habits is rapid. The student's interest in doing things at the same time that he is learning to use letters as numbers is much greater than under the old method.

The problems used are of such a general nature that they can easily be taught in any type of high school or in the last year of the junior high school. At the end of ten weeks the student has completed all of the mathematics that can be justified on the ground of possible utility. The next best thing has seemed to be an extended ability to use the equation in concrete problems. Hence the second ten weeks is devoted to the equations of elementary algebra with applications to concrete problems through quadratics, omitting most of factoring and fractions, all of exponents, and all of radicals.

For the second term, plane geometry with its training in forms of reasoning seemed more useful than the abstract part of the algebra. Hence this term is devoted to demonstrative geometry. In term three, geometry is finished and the State Regents' examination passed. Term four is used in completing elementary algebra including the Regents' examination. Beyond term four mathematics is elective and includes the usual subjects required for colleges together with a course in surveying and the use of the slide rule.

The results of this course may be summarized as follows:

1. There is much more mathematical insight and joy in the work than by the old method.
2. From a series of real problems properly organized, better training can be secured than from the ordinary abstract algebra.
3. The Stuyvesant Plan is an easy and natural method of introducing the pupil to the use of letters as numbers in algebra.
4. It is safe as far as Regents' examinations are concerned, as our records show.
5. Stuyvesant has tried to make the teaching of mathematics democratic,—that is, of the most use to the most people.

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COURSE IN SURVEYING AND THE SLIDE RULE.

This course is given in the fourth year, five periods a week for twenty weeks. Every student electing the course is obliged to take three hours per week of field work in the afternoon. This subject may be elected by boys who are taking trigonometry or have completed that subject.

The content of the course is equivalent to the first course in surveying in Columbia, and is so credited by that university. The work in the slide rule occupies about two weeks of time and includes a thorough drill in the operations performed on that instrument.

The text-book in surveying is Tracey's "Plane Surveying." For the slide rule, the manual published by Keuffel & Esser, New York City, furnishes sufficient material for the work of the course.

At the conclusion of this course a student is fitted for the usual field work, mapping, or computation of a surveyor's office. From this course entrance is easy into the City, State and Federal Civil Service in the capacity of chainman, rodman, or computer. Many of our graduates have found that his course has fitted them for good positions in which they earned a reasonable salary at the start and which served as stepping stones to very desirable engineering positions.

During the war, from this course, Stuyvesant High School furnished expert computers for service at the Sandy Hook Proving Grounds, where range tables for the big guns were constructed. In this work the slide rule was especially valuable.

This course in the use of the transit and the slide rule is eagerly elected by every student who can get it into his program. It is of immediate financial value to the boy who is not going to college, and it is credited as advanced standing to the student who goes to college.

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